

Santa Clara

Reference ID

Origin: California, USA

API Gravity

22.1

ESD 91

Equation(s) for Predicting Evaporation

$$\%Ev = (1.63 + 0.045T)\ln(t)$$

Where %Ev = weight percent evaporated; T = surface temperature ($^{\circ}\text{C}$); t = time (minutes)

ESD 96

Sulphur (weight %)

Evaporation

(volume %)

0	2.85	ESD 93
11	3.22	
22	3.41	

Water Content (weight %)

Evaporation

(volume %)

0	1.8	ESD 98
11	0.5	
22	0.1	

Flash Point ($^{\circ}\text{C}$)

Evaporation

(volume %)

0	-24	ESD 91
11	45	ESD 92
22	>90	

Reid Vapour Pressure (kPa)

25

ESD 91

Density (g/mL)

Evaporation

(volume %)

Temperature

($^{\circ}\text{C}$)

0	0	0.9327	ESD 91
	15	0.9202	
11	0	0.9587	
	15	0.9479	
22	0	0.9783	
	15	0.9672	

Pour Point ($^{\circ}\text{C}$)

Evaporation

(volume %)

0	-3	ESD 91
11	6	
22	27	

Dynamic Viscosity (mPa·s or cP)

Evaporation

(volume %)

Temperature

($^{\circ}\text{C}$)

0	0	1278	ESD 91
	15	304	
11	0	23700	(a)
	15	45570	(b)
22	0	1859	
	15	577100	(b)

Santa Clara

Reference ID

Dynamic Viscosity (mPa·s or cP)

Evaporation <u>(volume %)</u>	Temperature <u>(°C)</u>		
22	15	22760	ESD 91
Shear rate = (a) 10/s; (b) 1/s			

Emulsion Formation

Evaporation <u>(weight%)</u>	Visual stability	mesostable	
0	Viscosity (mPa·s)	2700	ESD 98
	Complex modulus (Pa)	18	
	Water content (wt %)	61	
11	Visual stability	mesostable	
	Viscosity (mPa·s)	20000	
	Complex modulus (Pa)	700	
	Water content (wt %)	50	
22	Visual stability	mesostable	
	Viscosity (mPa·s)	100000	
	Complex modulus (Pa)	360	
	Water content (wt %)	39	

Chemical Dispersibility (volume %)

Evaporation <u>(volume %)</u>			
0	Corexit 9500	6	ESD 98
	Corexit 9527	0	ESD 91
	Dasic LTS	0	
	Enersperse 700	5	
11	Corexit 9500	4	ESD 98
	Corexit 9527	0	
	Dasic LTS	0	
	Enersperse 700	0	
22	Corexit 9500	0	
	Corexit 9527	8	ESD 97
	Dasic LTS	7	
	Enersperse 700	7	

Hydrocarbon Groups (weight %)

Evaporation <u>(volume %)</u>			
0	Saturates	36	ESD 96
	Aromatics	22	
	Resins	29	
	Asphaltenes	13	ESD 91
	Waxes	6	
11	Saturates	32	ESD 96
	Aromatics	28	
	Resins	27	
	Asphaltenes	13	
	Waxes	4	ESD 98
22	Saturates	28	ESD 96
	Aromatics	32	
	Resins	23	
	Asphaltenes	17	
	Waxes	5	ESD 98

Santa Clara

Reference ID

Adhesion (g/m ²)			
Evaporation <u>(volume %)</u>			
0		55	SD = 11
11		69	SD = 6
22		112	SD = 19

Volatile Organic Compounds (ppm)

Evaporation <u>(volume %)</u>			
0	Benzene	150	ESD 94
	Toluene	660	
	Ethylbenzene	510	
	Xylenes	1060	
	C3-benzenes	2420	
	Total BTEX	2370	
	Total VOCs	4800	
11	Benzene	90	
	Toluene	330	
	Ethylbenzene	380	
	Xylenes	940	
	C3-benzenes	1790	
	Total BTEX	1750	
	Total VOCs	3540	
22	Benzene	0	
	Toluene	0	
	Ethylbenzene	0	
	Xylenes	0	
	C3-benzenes	200	
	Total BTEX	0	
	Total VOCs	200	

Surface Tension (mN/m or dynes/cm)

Evaporation <u>(volume %)</u>			
Temperature <u>(°C)</u>			
0	0	30.9	ESD 91
	15	28.7	
11	0	NM	
	15	28.0	
22	0	NM	
	15	31.8	

Oil/Salt Water Interfacial Tension (mN/m or dynes/cm)

Evaporation <u>(volume %)</u>			
Temperature <u>(°C)</u>			
0	0	28.6	ESD 91
	15	23.3	
11	0	NM	
	15	21.6	
22	0	NM	
	15	31.6	

Oil/Fresh Water Interfacial Tension (mN/m or

Evaporation <u>(volume %)</u>			
Temperature <u>(°C)</u>			
0	0	30.3	ESD 91
	15	25.7	
11	0	NM	

Santa Clara

Reference ID

Oil/Fresh Water Interfacial Tension (mN/m or

Evaporation (volume %)	Temperature (°C)		
11	15	24.9	ESD 91
22	0	NM	
	15	NM	

Boiling Point Distribution (weight %)

Evaporation (volume %)	Boiling Point (°C)	Weight %	
0	40	2	ESD 94
	60	2	
	80	6	
	100	8	
	120	10	
	140	11	
	160	12	
	180	14	
	200	15	
	250	21	
	300	26	
	350	33	
	400	39	
	450	47	
	500	55	
	550	63	
	600	70	
	650	77	
	700	82	
11	60	1	ESD 96
	80	1	
	100	2	
	120	2	
	140	3	
	160	5	
	180	7	
	200	9	
	250	14	
	300	21	
	350	29	
	400	37	
	450	46	
	500	55	
	550	63	
	600	70	
	650	76	
	700	82	
22	180	1	
	200	2	
	250	7	
	300	14	
	350	23	
	400	32	
	450	43	
	500	52	
	550	61	
	600	69	

Santa Clara

Reference ID

Boiling Point Distribution (weight %)

Evaporation <u>(volume %)</u>	Boiling Point <u>(°C)</u>	Weight %	
22	650	76	ESD 96
	700	82	

Boiling Point Distribution (°C)

Evaporation <u>(volume %)</u>	Weight %	Boiling Point <u>(°C)</u>	
0	5		ESD 94
	10		
	15		
	20		
	25		
	30		
	35		
	40		
	45		
	50		
	55		
	60		
	65		
	70		
	75		
	80		
	85		
11	5		ESD 96
	10		
	15		
	20		
	25		
	30		
	35		
	40		
	45		
	50		
	55		
	60		
	65		
	70		
	75		
	80		
22	5		
	10		
	15		
	20		
	25		
	30		
	35		
	40		
	45		
	50		
	55		
	60		
	65		
	70		
	75		
	80		

Santa Clara

Reference ID

Boiling Point Distribution (°C)

Evaporation <u>(volume %)</u>	Weight %	Boiling Point <u>(°C)</u>	
22	80		ESD 96
	85		

Metals (ppm)

Evaporation <u>(volume %)</u>	Aluminum	<5	Cao 92
0	Barium	<0.3	
	Cadmium	<0.5	
	Calcium	42.0	
	Chromium	<1.5	
	Cobalt	<1	
	Copper	<0.6	
	Iron	115.0	
	Lead	<3	
	Magnesium	1.8	
	Manganese	<0.3	
	Mercury	<15	
	Molybdenum	1.5	
	Nickel	77.0	
	Selenium	<15	
	Strontium	0.2	
	Tin	<15	
	Titanium	<0.6	
	Vanadium	193.0	
	Zinc	<0.6	
11	Barium	0.6	
	Chromium	<1.5	
	Copper	<0.6	
	Iron	155.0	
	Lead	<3	
	Magnesium	2.6	
	Molybdenum	2.0	
	Nickel	97.0	
	Titanium	2.0	
	Vanadium	250.0	
	Zinc	<0.6	
22	Barium	0.7	
	Chromium	<1.5	
	Copper	<0.6	
	Iron	155.0	
	Lead	<3	
	Magnesium	3.3	
	Molybdenum	<0.6	
	Nickel	101.0	
	Titanium	1.9	
	Vanadium	240.0	
	Zinc	0.6	

Aqueous Solubility (mg/L)

Room temperature	11	(a)	ESD 91
(a) fresh water			

Santa Clara

Reference ID

Acute Toxicity of Water Soluble Fraction (mg/L)

Test Organism

48h LC50

Daphnia magna

8 (a)

Harris 94

(a) results based on GC purge-and-trap analysis